RINGWORM

ITS

DIAGNOSIS & TREATMENT

ALDER SMITH

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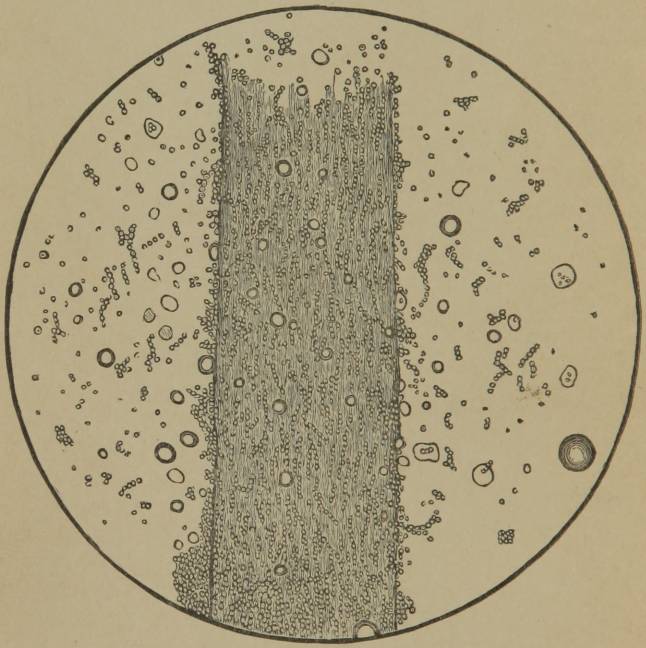
FIG. 1.



The *projecting part* of a broken hair or stump, removed from a *recent patch* of ringworm, showing the conidia and fat globules.

RINGWORM:

ITS

DIAGNOSIS AND TREATMENT.

BY

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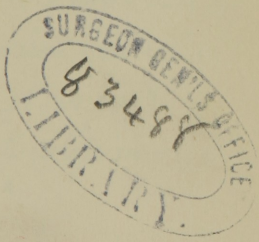

PHILADELPHIA
PRESLEY BLAKISTON, 1012 WALNUT STREET
1881

PREFACE.

HAVING devoted much attention during the last ten years to the diagnosis and treatment of Ringworm, and particularly of chronic and inveterate cases, I have endeavoured in the present little work to give, as the result of a more than ordinary experience of the disease, some useful and thoroughly practical hints on the subject, and *especially* as to the production of *kerion*, the inflammatory form of the affection, and nature's method of effecting a cure. If this can be produced *artificially*, a speedy and certain cure is the result.

Some of the following observations recently appeared in the columns of "*The Lancet*," and I now reprint them, with many additions, and a new

diagram of a hair recently affected with ringworm, in the hope that they will be serviceable to the medical practitioner, in his endeavours to diagnose and eradicate this insidious and very troublesome complaint.

Christ's Hospital, London, E.C.
November, 1880.

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RINGWORM:

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DIAGNOSIS AND TREATMENT.

CHAPTER I.

Introductory Remarks.

It is surprising that the results of the treatment of ringworm of the head should generally be so very unsatisfactory, but such is the fact; and, though many cases of the disease are quickly cured, yet a large proportion are allowed, through inefficient treatment, or no treatment at all, to lapse into the chronic form before the disease is well taken in hand.

It must always be remembered that we have to destroy a fungus that is rapidly insinuating itself into the deeper parts of the epidermic strata of the follicles, and between the fibres of the hairs, and therefore fast getting out of the reach of remedies *simply applied* to the surface of the scalp.

Ringworm is essentially a *contagious* disease,

yet we must not deny the possibility of the transmission of the conidia through the air, as the late Dr. Tilbury Fox found the fungous elements in abundance in the dust deposited from the air of a ward in which ringworm cases were located. The contagious nature of the affection has been fully demonstrated by experiments, as well as by clinical observation.

As to the nature of ringworm Dr. Fox says:—"The arguments in favour of the assertion that the growth of the parasite is the essential cause of the inflammatory symptoms and the disorganised state of the hairs in ringworm are unanswerable. I will mention but one or two. No such textural alteration as is present in the hairs in ringworm is ever produced except by the attack of the fungus upon them; with the destruction of the fungus the disease at once ceases; parasiticides, if they reach the fungus, speedily cure the disease; and lastly, the fungus can be shown to be a vegetable structure by artificial cultivation, which is impossible in the case of degenerate animal structure; and by chemical manipulation."*

Ringworm may attack any part of the body, though it is much more difficult to eradicate when

* *Lectures on Ringworm*, Dr. Tilbury Fox.

it exists on the head. Ringworm of the body, as it is generally seen in England, is readily cured by almost any parasiticide, because the mischief lies close at hand, and can easily be dealt with. Ringworm of the head rarely occurs after the age of puberty; but cases have sometimes been seen in the adult. Ringworm of the body may develope at any age, though it is much more common among children; and, if seen in adults, is generally observed on the hands or arms of those attending children afflicted with the complaint. Very rarely, it may attack the hairs of the beard, producing *parasitic, or tinea sycosis.*

Tinea tonsurans and *tinea circinata,* differ only as regards their locality. The former often infects the body and produces patches of tinea circinata. The fungus in both is the *trichophyton tonsurans.*

The question of the exact nature of the fungus is a very difficult and intricate one to answer, and I shall not attempt to pursue the subject here, but refer any reader who desires to follow it up, to Hebra's work on skin diseases,* but I quote the following:

"It will be seen that, in spite of the numerous observations on record of attempts at cultivation,

* Hebra *on Diseases of the Skin,* vol. v., pp. 114 to 138. New Sydenham Society, 1880.

we are far from being able to determine the proper relationship of the fungi met with in well established parasitic dermatoses to one another, or to the mould fungi. If, therefore, some pathologists hold the opinion expressed by Hebra of the identity of favus and tinea tonsurans to be true, and even include pityriasis versicolor also, it is important that it should be understood that they are *not* at all supported by scientific mycology at the present time:"—"It follows necessarily, that we must, for the present, regard the fungi met with in the dermatomycoses as specific individuals."

When the fungus first effects a lodgment on the surface of the skin it causes irritation, a certain amount of inflammation with redness, and often minute vesiculation, followed by desquamation. Then it attacks the hairs, rendering them dry and brittle, splitting them up, and disorganising them.

As regards the treatment, although general and constitutional remedies are most beneficial in the *chronic* forms of the disease, yet the *essential* point to remember, is, the fact that *the fungus must be destroyed by local applications*, general treatment *alone* being absolutely useless.

Ringworm affecting parts of the body not hav-

ing deep-rooted hair, is, generally, easily eradicated; as well as ringworm on very young children, and recent cases of scalp disease; but, now and then, although the very best treatment is adopted, the ringworm will spread *in spite of* ordinary remedies, the skin of some individuals seeming to afford a soil more particularly favourable to the growth of the fungus.

This is especially seen in children of a strumous or lymphatic diathesis; and it is often observed that all the children in a family of this description, if they become infected, will suffer either slightly or severely, evidently showing that there is some general condition present favouring the parasitic growth.

Ringworm does not exercise any noticeable influence on the general organism or constitution.

CHAPTER II.

The Different Varieties, and the Diagnosis of Ringworm of the Head.

I do not propose to give a general description of ringworm, as the ordinary characteristics of the complaint are familiar to all medical men, but will pass on to make a few practical remarks, for the most part suggested by my own actual observation and experience.

In the first place, I cannot help observing that very few medical men, either in consultation or private practice, are aware how extremely difficult some cases of ringworm are to cure; and the majority consider a case well, even when it has assumed a decidedly chronic state. Many boys are presented for admission to Christ's Hospital who, while bringing certificates from medical men of the highest professional standing that they are cured from ringworm, are still suffering from a severe form of the disease. I have often found, on inquiry, that an opinion has been formed, and a certificate given, without any special examination of the scalp, and certainly without

the help of a lens or microscope. Most practitioners imagine that a ringworm is cured when the hair is again growing freely and firmly on the part affected. This is a great mistake, as some of the most chronic cases are those in which the hair has grown again on the patches, but, on close inspection with a lens, some scurfiness, and *many broken hairs or stumps may be seen scattered among the healthy hairs.*

Speaking from experience, after the examination of a very large number of children, I have found that in the majority of cases where a boy or girl has had ringworm on the head within a year or two of my seeing them, the disease has not been really cured. As a rule, the treatment has been continued until some new hair has made its appearance, after which it has been discontinued, although many diseased stumps remained.

Besides the usual cases mentioned above, that is where there are numerous broken hairs to be seen on old patches, I sometimes find that the stumps have been rubbed down by friction, or partially removed by attempted epilation, before the examination. Under these circumstances, we see numerous follicles, with no hairs growing from them—a most suspicious sign,—and also some black dots. These *black dots* are the orifices

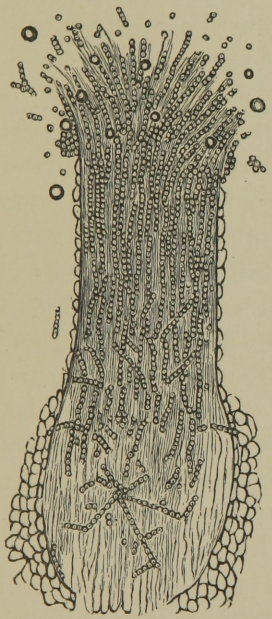
of diseased follicles, in which the stumps have broken off on a level with the surface of the scalp by friction, or are the apertures, filled with dirt, left by the retraction of the broken and shortened stump into the follicle after attempted epilation.

Especially would I call attention to a variety I call *disseminated ringworm*—one rarely diagnosed, and the most chronic and difficult to cure. The hair is growing freely and firmly all over the head; there are no patches to be seen now, although probably they have existed at an earlier stage of the disease; the skin appears generally healthy, and perhaps almost free from scurf: but numerous isolated stumps, or groups of stumps, are seen here and there, often scattered all over the scalp. This variety is almost always overlooked, and can only be detected by very careful examination.

The stumps in old chronic cases are very brittle, and almost always break on attempted epilation, showing *under the microscope*, after soaking some little time in liquor potassæ, a most extensive implication with fungus, even down to the bulb of the hair. Rows upon rows of conidia, like strings of beads, are seen running parallel to the filaments, splitting the substance of the hair, and causing it to appear almost double the ordinary

size. Where the disease has continued for a year or longer, the whole thickness of the hair seems to be filled with these rows of conidia, which gives it the appearance of a solid mass resembling *fish-*

FIG. 2.



A stump, very full of fungus, taken from a case of chronic ringworm, of nearly three years duration, showing the rows of conidia, even down to the bulb, and the appearance of the stump where it has been broken off, frayed out, and some oil-globules.

roe. Now and then a hair may be seen to be distended and ruptured along its shaft, the filaments with conidia protruding at these points, and in some cases the fungous elements so abundant as to completely disintegrate the hair. The free end of the broken stump possesses a jagged, stubble-like, frayed-out extremity. Between the filaments of the faggot-like end many conidia are seen. (*Vide* Fig. 2).

Cases like this have certainly existed for many months, or, more likely, for a year or two, and may have given the disease to many other members of a family, while all the time they have been overlooked, or thought to be well.

But apart from these varieties, some of which are exceedingly difficult to diagnose, I have had children sent to me, certified as cured, when there were *typical patches* existing as large as a five-shilling piece, itching, and covered with very short, broken, dry, opaque, and twisted hairs, looking as if they had been nibbled-off, frequently of the usual yellow or ash-grey colour, and with fine opaque branny scales or scurf, evidently showing that some medical men have no idea what ringworm is like; and even when these appearances are pointed out to them, *they affirm that the disease is dried up and cured, and that the child is quite fit to mix with other children.*

The occurrence of the short nibbled-off stumps is most characteristic, and with ordinary precautions no mistake ought to be made. Broken hairs, or stumps, for microscopical examination should be carefully removed with a pair of fine pointed forceps, and placed in a drop of liquor potassæ on the centre of a glass slide. The cover-glass should be applied, and the specimen left, if possible, for a few hours, in order to make it more transparent. The thin glass should then be slightly pressed down, so as to compress the stump, and spread out the mass of conidia.

The shaft, (*Vide* frontispiece), will then be seen to be covered in parts with thick masses of conidia, but not to be split up so much in its substance, as is the case after the disease has existed some time. (*Vide* Fig. 2). The hair appears opaque at first, and often of a reddish brown colour. The shaft is seen to be invaded by the conidia, and even mycelium threads may be observed on the surface, and penetrating the substance of the hair; but the broken end, though swarming with conidia, does not appear quite so frayed out as it does in the previous specimen, taken from a case of much longer standing. Many conidia, in groups or strings, are seen floating about the field, together with oil globules, epithelial cells,

and debris. The little masses of regular sized, and circular conidia are very characteristic, and show the specimen to be fungus, and not simply fat globules. Sometimes, in cases not under treatment, masses of fungous elements are often removed that require teasing out with a pair of needles, before the conidia can be distinctly seen.

If the fine epidermic scales are examined, the mycelium filaments will, as a rule, be seen, as well as conidia, penetrating between them.

The *conidia, or spores,* measure about the $\frac{1}{7000}$ to the $\frac{1}{3000}$ of an inch in diameter.

The fungous elements do not penetrate beyond the epidermic strata, and are found in the hairs and the inner root-sheath. The hair papillæ are never invaded.*

It is a great mistake to think that ringworm of the scalp usually presents itself to the medical practitioner as a red, rough, or scaly spot of a ring-like form, almost destitute of hairs; the appearance of ordinary ringworm of the skin (described further on,) is not often seen on the head. At an early stage of the disease, there may be only a very small scurfy spot or two, containing hairs more brittle than usual; but as a rule the

* For further information on this subject *vide* Hebra's work on Skin Diseases, 1880.

doctor does not see the case until one or more of the hairs are broken off short.

If ringworm of the head is observed at its commencement, a small ring of minute, pin-head sized vesicles, on a red base, may sometimes be seen. These quickly terminate in desquamation or furfuraceous scales, and the places rapidly spread, and soon put on their characteristic appearance.

Recent typical patches vary in size, are more or less circular in shape, and of a greyish or slaty colour; they are covered with fine opaque branny scales or scurf, and are more or less bald, with numerous broken hairs or stumps. The scalp is slightly raised, and the follicles are too prominent, the skin having the appearance of *cutis anserina*. The surface is covered with dry lamellated scales, and, here and there, slight crusts may be observed. Small, asbestos, sheath-like coverings, of a dull white colour, and composed of epidermic scales mingled with fungous elements, more or less surround the base of the stumps. This gives rise to a white frost-like looking surface.

Most of the hairs have become broken off; and those remaining can usually be easily pulled away whole, or else they break off on the slightest

traction. The hairs are lustreless, and look as if covered with fine dust; and most of them being broken off short, as if they had been *nibbled*, give the part a stubble-like appearance. The stumps are thickened, dull, dry, opaque, brittle, and usually break on attempted epilation. Some of the hairs are twisted, and bent at an angle, after emerging from the follicles.

There is generally some itching of the surface, and this may be one of the first symptoms of ringworm.

At other times actual stumps are not seen, but shortened irregular twisted-looking hairs, sometimes lying quite flat on the scalp, and of a lighter colour, which, on attempted epilation, break off and show the usual fungus.

Sometimes the head may become partially covered with crusts, with the stumps to be seen underneath them. *Chronic ringworm* may also occur in the form of pustular spots, with a stump in the centre. This appears to be nature's effort to get rid of the stump, and can be successfully imitated by treatment. A very chronic form is also often observed, in which there are one or more large irregular patches, often extending nearly all over the scalp. The surface is very scurfy, and very many of the long hairs remain, together

with numerous stumps. This variety is sometimes mistaken for seborrhœa or eczema, but can always be diagnosed by the stumps. Cases are even found where the entire scalp is affected.

When is ringworm to be pronounced well?

Medical men should not consider a case cured, or certify a child free from ringworm, unless they have most carefully examined the whole scalp in a good light, and scrutinised any suspicious spot with a lens, and are certain that there is not to be seen a single stump (or even the black dots before mentioned,) giving evidence of the fungus under the microscope. Sometimes it is extremely difficult to detect the stumps when only a few exist; and often the attention is directed to the short hairs round a treated patch (caused by the hair having been cut,) instead of to the diseased stumps, which are frequently concealed by the healthy hairs, and only protrude about a sixteenth part of an inch. Stumps are often of a lighter colour than the rest of the hair; and as long as any remain—and they may exist for years—the disease is not cured, and may continue stationary, or spread again, and moreover give the malady to other children.

If *all* the bulbs could be extracted together with the stumps, the disease might be considered cured; but almost always one or more will break off, allowing the root part, which of course contains the fungus in an active state, to remain behind in the follicle, out of which it will not protrude again for a week or two. It constantly happens that a doctor removes, as he thinks, all the stumps from a patch, and certifies the case to be well. But if the place is watched a few weeks, the stumps will probably appear again; in fact, I consider it *extremely difficult to certify that a child who has had ringworm is absolutely well.* Time after time stumps will crop up here and there, breaking off when an attempt is made to extract them; and they may continue to re-appear for months after the case in other respects seems well. Even specialists will be deceived, and after putting a strong caustic on a single patch, and thus getting a bald place apparently quite free from stumps, they will certify the case to be well; but after a week or two, up come the stumps again, and prove the incorrectness of the certificate. A bald patch should therefore, never be considered well until the new downy hair is growing freely, without a single stump, or black dot, among it.

Atrophied stumps. Sometimes, when ringworm

is cured, especially after the head has been shaved, there are a few *atrophied* stumps seen. These easily come away *entire* when extracted. They have small atrophied roots, and show no fungus under the microscope, the ends being sharp cut (from shaving) or blunt, and often pigmented; the shaft being of the normal, or less than the normal thickness.

In old chronic cases the diseased stumps undergo some fatty degeneration, and thus many small oil-globules are seen in and about them, as well as conidia; but small oil-globules on a normal hair or atrophied stump must not be mistaken for conidia. To a practised eye there is no difficulty in diagnosing between atrophied and diseased stumps. The regular, equal-sized, and bead-like arrangement of the bright and circular conidia, with their double contoured outline and nuclear contents, on or in the substance of the hair, cannot be mistaken when once seen. Ether will also distinguish oil-globules from conidia, by dissolving the former; although the fractured, faggot-like appearance of the broken end of a diseased stump is most characteristic.

Diagnosis.

In diagnosis I place but very little reliance on

the fact that the hairs come out easily round a suspicious spot, as they may do so with equal facility all over the head in children where ringworm is not present, and be very firm in obstinate forms of the disease. *A very common error* is to take a long hair, or one short, from previous cutting or shaving, growing close to or even on a patch of ringworm, and, finding no conidia on it under the microscope, to conclude the disease is cured. It is *useless*, as a rule, to look for conidia on the long hairs taken from or around a treated patch. The whole attention for diagnosis and prognosis must be paid to the short stumps.

I have seen a bald patch on a boy's head, purposely made by pulling out the hair, very much resemble ringworm, as it happened to be on a scurfy place, but of course it contained no stumps.

Tinea decalvans, alopecia areata, or circumscripta. There is little fear of *alopecia areata* being mistaken for ringworm, when it extends over a considerable portion of the scalp; but, what is called, *tinea decalvans*, or *small patches of alopecia*, may simulate it.

Dr. Liveing, in his work on the diagnosis of skin diseases, says: — "*Tinea tonsurans* occasionally produces perfectly smooth, bald, shining patches of skin, bearing a close resemblance to

alopecia areata :—it is the occasional development of these temporary, smooth, bald patches in common ringworm which has given rise to the erroneous belief that there is a parasitic disease called *tinea decalvans, distinct* on the one hand from *tinea tonsurans,* and on the other from *alopecia areata ;* no such disease really exists."

Against this opinion I quote the following from Dr. Tilbury Fox's work on skin diseases :— "At the present time there is a 'dead set' made by almost every writer on diseases of the skin *against* the parasitic nature of *tinea decalvans,* and I believe I stand alone in my opinion of its parasitic nature :—now I am quite ready to admit that this parasitic disease is not common—far from it, and that the *majority* of cases of circumscribed baldness observed in the head are *not parasitic at all.* But I cannot but state that I have found fungus elements without doubt."

Dr. Liveing's view offers a possible explanation of the facts recorded by Dr. Tilbury Fox, who himself admits the *rarity* of the parasitic affection.

A remarkable outbreak of tinea decalvans, at Hanwell School, is reported by Dr. Hillier,* who also believed in the parasitic and contagious nature of this disease.

* *Handbook of Skin Diseases,* Dr. Hillier, p. 286.

My own experience is certainly in favour of the *non-parasitic nature of alopecia areata or circumscripta.* I have never been able to discover the fungus on the club-shaped stumps, nor have I ever seen a bald patch where I could not decide, whether it was tinea tonsurans, or alopecia areata.

With regard to the *practical* question of admitting a case of circumscribed alopecia into a school, I may say that *I do not fear its spreading,* and therefore would *not* reject it.

At any rate, whether parasitic or not, *tinea* (?) *decalvans, or alopecia areata* ought to be distinguished from *tinea tonsurans.* In the former affection we see one or more, generally circular, bald spots. The places are perfectly smooth and shining, instead of being scurfy; there is no change of colour in the skin, nor is it raised; and no *ordinary* stumps are to be observed, although a few club-shaped short hairs, or stumps, are generally to be found at the circumference of the patch.

These club-shaped stumps have atrophied roots; are easily extracted on the slightest traction, *instead of breaking off:* and, *very rarely*—according to some authorities—some minute fungus is to be discovered under the microscope, but *never* the appearance seen in *Figs.* 1 or 2. The

bulb will be found to be tapering, and reduced in size; while the free club-shaped end is thickened, and more opaque, exhibiting at times, clusters of fibres radiating outwards in a brush-like form.

There is another kind of baldness sometimes mistaken for ringworm, *viz.* a bald, or partially bald, patch on the occiput of a young child, that has been caused simply by the head being bored in the pillow at night.

Local scurfiness, without stumps, does not necessarily imply ringworm; but such spots, especially in light-haired children, or if the disease exists in another part of the head, are very suspicious, and must be carefully examined with a lens, and the scurf placed under the microscope. Often a *single* stump alone will be discovered. General scurfiness or seborrhœa, however, must not be mistaken for ringworm.

There is a variety of local scurfiness of the head which sometimes very closely simulates ringworm. Patches are seen, where the hair has partially fallen off, having the usual scurfy appearance of chronic ringworm; even scabs may exist from slight eczema; and what is more likely to mislead, *a false appearance of stumps, caused by the white epidermic scales running up a short distance on*

the shafts of healthy hairs, as an asbestos-like sheath, and thus very much resembling ordinary stumps. With a lens there is no difficulty in the diagnosis, as no broken hairs are present.

Squamous eczema and psoriasis of the scalp, must also be diagnosed from ringworm. *Many* points of difference are given in the text books, but the only one of *practical* importance is the absence in these diseases of any characteristic stumps on the scurfy patches.

Favus. The diagnosis of *favus* is easy, if the sulphur-coloured crusts have formed, but at its commencement it may be mistaken for ringworm. The hairs can generally be pulled out, in the early stage of favus, with entire bulbs and shafts, whereas in tinea tonsurans the stumps break off and leave the bulb and part of the shaft behind.

Percentage.

Parents and friends will not, as a rule, credit the diagnosis of inveterate cases, nor believe the time the ringworm has existed, and the time it will probably take for its cure. Very many children in private families often have this disease without its being suspected. We issue strict instructions that children who have ringworm will

not be admitted into Christ's Hospital, and yet, during the last five years the average percentage of boys that have had the disease unknown to their parents, or have been thought to be quite well when first brought up for admission is 8·4.

The following table will show the number of boys (age from eight to ten years,) coming up for examination here for the *first* time, and the number of cases of ringworm *of the head* detected among them :—

Christ's Hospital.	1875	1876.	1877.	1878	1879.	Total in 5 years.
The number of boys examined the first time, supposed to be quite free from ringworm ...	193	190	174	187	205	949
The number of ringworm cases (of the head) detected	15	20	10	19	16	80
Age 8 to 10 years—Average percentage	...	...	...	...	...	8·4

During the five years many of these boys were examined over and over again, and in all there were 143 more postponements, during this time, of boys brought up a second, third or even a ninth, or tenth time.

With regard to girls, very few have been examined here until within the last few years.

During 1878—80 forty-four girls were examined for the *first* time, and eleven were found to have ringworm of the head—*i.e.* 25 per cent. During these two and a half years there have been nineteen more postponements of these cases, when brought up a second or more times. While mentioning this average, I trust it is far above what I shall find in future.

Ringworm occurs among the rich as well as the poor, and in all parts of the kingdom; but it is especially frequent amongst the children of the lower orders that attend school. I once examined a school of boys of this class, and found more than half of them had ringworm of the head. Without going into the reasons for its being so, I may remark that the disease is much more contagious among children under ten years of age than it is among those who are older, and that it is rarely contracted after the age of fourteen.

CHAPTER III.

Ringworm of the Body—Tinea Circinata.

Patches of tinea circinata are often observed on the face, neck, chest, or arms of children suffering from ringworm of the head, though they also frequently occur alone.

They are usually first seen as small red, *circular* spots, each about the size of a split pea, or less; and often herpetic in character. These generally quickly enlarge at their circumference, where the redness and minute vesiculation is most marked; while the centre becomes somewhat natural again. The margins of these annular patches are slightly elevated, and sharply defined against the healthy skin: the vesicles are only pin-point or pin-head in size, are extremely evanescent, and do not leave a crust, but only simple desquamation. Often vesicles are not seen, but only red erythematous patches. The places are slightly *raised*, and covered with a fine branny or furfuraceous desquamation; and, as they enlarge, the skin in the centre becomes normal again, or has a whitened, scurfy, and shrivelled appearance. The rings, thus

formed, may coalesce and cause irregular patches or semicircles and segments of circles. Itching is generally a marked symptom.

The disease is superficial, and shows no disposition to symmetry, except perhaps through contagion in certain regions, as on the inner sides of the thighs. Some cases of body ringworm are very extensive; and they may be recurrent; but, in England, most are slight, and easy to cure.

Diagnosis.

Sometimes a patch of ringworm of the body is mistaken for *squamous eczema*, or, vice versa; but the former can generally be distinguised by its abrupt margin, and annular form, by becoming normal again in its centre, and by its history.

Seborrhœa, or pityriasis, especially of the face and back, sometimes very much simulates ringworm. The latter can generally be diagnosed by its annular form, while a patch of pityriasis is rarely circular, and has the same character all over.

Some patches of *psoriasis* much resemble ringworm, but they can be diagnosed by the presence of other small places about the body, and by the history of the case.

There should be but little difficulty in the diagnosis of any doubtful, scaly, circular spots, as a *careful* examination of the scurf under the microscope, will show the fungus, if present.

To obtain scales for examination, the inner part of the outer ring, just where it is commencing to desquamate, should be scraped with a blunt knife. The epidermis, thus obtained, should be placed in a drop of liquor potassæ on a glass slide. The fungus may not be found, if the cells are only taken from the outer portion of the ring which is not desquamating, or from the central portion, when nearly healed.

The mycelium is seen, under the microscope, as long, slender, sharply-contoured threads, jointed at intervals, and forming an irregular network between the epidermic scales. It is important not to mistake shreads of wool or cotton for mycelium. The outline of the threads is always clearly defined, and they contain a few spores here and there.*

The Treatment of Body Ringworm.

It is advisable to have all the body linen and flannels boiled; and a bath should be given, and

* For further information on tinea circinata, and its rarer varieties, I must refer the reader to Dr. Tilbury Fox's work on *Skin Diseases*.

the whole body well washed with carbolic acid soap; this should be repeated if the disease be at all extensive or recurrent.

Small recent patches are generally easily cured by any parasiticide. Painting the places, and outside them for a quarter of an inch, a few times, with ordinary acetic acid or Coster's paste, at intervals of one or two days, is a good plan if they are situated on the neck or body; but if on the face acetic acid generally causes too much irritation. In such cases, and with young children, I prefer a solution of sulphate of zinc, one drachm to the ounce; or carbolic acid mixed with six or eight parts of glycerine jelly (glycerinum amyli): bichloride of mercury, two grains to the ounce of vaseline, is of service; also dilute citrine ointment, about one part to five or seven of lard, oleate of mercury, five per cent. solution, and tincture of iodine.

I do not advise the use of Goa powder or chrysophanic acid ointment to the face or neck, as it produces much discoloration and often severe irritation. I have even seen impetiginous eczema of the face caused by its use.

One important practical point to remember, is to thoroughly examine the *head* of every child who has a spot of body ringworm, as the slighter af-

fection is often only secondary to disease of the scalp.

Eczema Marginatum.

Eczema Marginatum, is a name given to a rare variety of ringworm attacking the inner sides of the thighs, and between the nates and the genitals. It developes under friction, warmth and moisture, and spreads at its circumference with a raised border, vesicles, and crusts, while the central portions heal, generally with marked pigmentation. If the disease has existed some time, the parts get thickened by constant scratching, as the complaint is attended with much irritation. This variety is very troublesome, and though the fungus may be seen at first, yet, if the disease gets inveterate, it may be absent; and the place partakes of the characters of eczema.

Treatment. The usual precautions must be adopted, and sulphur ointment and oil of cade, sulphurous acid lotion, or chrysophanic acid ointment (five grains to the ounce of vaseline) applied. Dr. Fox advises a solution of hyposulphite of soda (one drachm to the ounce) to be applied on linen under oil-silk, after the parts have been thoroughly washed with soap and water.

Tinea Tonsurans of the Nails.

Very rarely the finger nails become infected with the ringworm fungus. They get dry, opaque, thickened, furrowed, fissured, and brittle. This disease can only be diagnosed by finding the fungous elements. It is very difficult and tedious to cure.

Parasitic Sycosis—Tinea Sycosis.

I may mention that there are *two* distinct varieties of *sycosis*, one parasitic, the other not. In England, the ringworm fungus *very rarely* attacks the hair of the beard, giving rise to the *parasitic* variety of sycosis.

In this affection the hairs break off as in ringworm of the scalp, and under the microscope are seen to be swarming with the fungus, as described under tinea tonsurans. The follicles generally inflame and become indurated, when the disease very much resembles true sycosis.

The hairs get dull and brittle; but the broken stumps can often be extracted entire, because they are thicker and firmer than those of the scalp, and are loosened by inflammation and pustulation: many however will break off.

The skin becomes nodular and indurated in time, and studded with tubercles and pustules. The moustache is not often involved.

Diagnosis. Very often the ringworm extends on to the neck or face, beyond the limits of the beard, and then the usual characters of tinea circinata are seen. Parasitic sycosis generally spreads all over the beard, while the non-parasitic variety is often restricted to a certain portion, and as a rule exhibits more crusting. The hairs in the former can usually be extracted without pain; but the microscopical examination of the stumps will decide the question.

Sycosis may remain as an independent malady after all the fungus has been destroyed.

Treatment. The best plan is to epilate *freely* and employ some mild parasiticide. I have found the constant application of oleate of mercury (five per cent. solution) the most effectual remedy, combined with frequent and careful epilation of all diseased hairs and stumps. The oleate must be freely rubbed into the follicles, and the roots of the hairs, night and morning, with a small sponge mop. When the fungus is thoroughly destroyed, by the oleate soaking to the bottom of the follicles, the healthy hairs will appear, and the scabs, &c., can be removed by simple treatment. Car-

bolic-glycerine may also be applied to the centre of each pustule with a gold needle. Sometimes *dilute* citrine ointment is very useful.

CHAPTER IV.

The Treatment of recent Ringworm of the Head.

The question of the easy curability of any given case of ringworm of the head, except in very young children, depends chiefly upon the length of time the disease has existed, before it comes under efficient treatment. A good vesicant, such as blistering fluid or glacial acetic acid, used at an early stage, will generally destroy the fungus and cure the disease. This is especially seen when applied to the fresh places, which so often appear during the first few weeks of the treatment of an ordinary case.

Remedies, as a rule, are not properly used, nor is sufficient time spent by the nurse on the care of the case. Ointments or lotions are *simply applied,* instead of being *thoroughly rubbed in.*

It must be remembered that the fungus is rapidly insinuating itself into the follicles, and that to secure success, the parasiticide must be well rubbed into them.

When a case is first seen, the most important

point to determine, after deciding how long the disease has existed, is the extent of surface involved. The whole head must therefore be most carefully examined, and if the patches are at all numerous, or cover any large extent of the scalp, *it is absolutely necessary to shave off the hair of the head*, or what is better still, to cut the hair very close with scissors all over the head, leaving, perhaps, a little fringe at the back and front for appearance sake.*

Shaving the scalp is preferred by some, but it is not at all essential, and the close cutting is equally efficient. When the hair is removed, it is easy to see the diseased places, which then appear dry, scurfy, and of a dull greyish or leaden hue.

In cases where there are only two or three small places, it is sufficient to cut the hair off the patches, and for about half an inch round them.

Then one of the best plans is to blister them freely with liq. epispasticus, and after a day or two, during which time simple water dressing may be used, to begin the application of carbolic glycerine. Blistering large surfaces is very pain-

* A *miniature* horse-clipper, suggested by Dr. Balmanno Squire, is a very convenient and useful instrument for rapidly cutting the hair short. This may be obtained at the instrument makers.

ful, and not without risk, and, in my opinion, is quite out of the question with young children.

Carbolic glycerine is a very excellent remedy. The strength can be varied from equal parts of the pure crystals melted, and glycerine, to one of carbolic acid, to two or even six parts of glycerine, according to the extent of surface to which it is applied, the age of the patient, or the effect produced. The glycerine penetrates freely, and carries the acid to the conidia. It is cleanly, seldom painful, and though I have used it most freely for the last eight years, I have only once seen any toxic effect produced, and that was when applied for some time to the entire shaved scalp of a child about five years old. Should, however, the patient become at all drowsy after the application of the acid, it is better to discontinue its use at once.

If the ringworm be so extensive as to require the removal of the greater part of the hair, the carbolic glycerine *may* be applied to the entire scalp, as strong as it can be borne without causing pain or blistering; but it is necessary to exercise great caution, using a weaker solution in the case of young children; and it is also advisable to apply it only to a *portion* of the scalp the first time, and to note its effect.

In the case of a child under five years of age, I should begin with *one* part of carbolic acid to *seven* of glycerine; if six or seven, about *one* part to *five* of glycerine; if eight or ten, about *one* to *three* or *four* of glycerine; *but in extensive cases I greatly prefer the ointment* described further on.

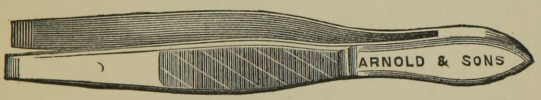
In employing carbolic glycerine, the most important points to remember are, to apply it often, say twice or thrice a day, and to have it well rubbed into the places with a sponge mop.* Nurses generally shirk this duty; therefore, the doctor must take care to see that this preparation is properly applied. It will take three or four months at least, of this treatment to produce a complete cure, and to get the new downy hair to grow. At the same time, if the remedy be only applied to the patches, a weaker solution, say one in eight, must be well rubbed into the entire scalp at night, to insure the destruction of any conidia that may be present, and prevent the extension of the disease. During the first part of the treatment, the hair should be kept closely cut, and any small patches of ringworm should be, now and then, painted with strong carbolic acid and glycerine (equal parts), blistering fluid, or glacial acetic

* These mops can be made by tying a small piece of sponge on to the end of a penholder.

acid. The scabs produced by these applications should be removed with forceps as soon as formed, —often bringing away with them many diseased stumps,—and the parasiticide again used, after free epilation.

Children, when under this treatment, should have their heads well washed with soft-soap and water every other day, and epilation should also be freely and frequently practised, with a broad, flat-pointed pair of forceps. (*Vide* Fig. 3).

Fig. 3.



It is best to pull the stumps gently with a steady motion, and to cleanse the forceps each time, by wiping them on a small sponge placed ready for the purpose in a small basin of water. The nurse can easily be taught to do this most necessary, and generally neglected, operation. Some time each day ought to be spent upon it.

During epilation the majority of the stumps simply break off, usually a short distance above the bulb; but much good is done by even partially removing them, as the carbolic glycerine is able

to penetrate better into the follicles and to destroy the conidia at the bottom of them.

Sometimes the places get very tender and sore, under the carbolic glycerine or other treatment, and the child cannot bear any *rubbing in* of the remedy, or even the epilation, as it causes too much pain. Under these circumstances, a little perseverance with carbolic glycerine or ointment,* *simply painted on*, with constant poulticing at night, will frequently set up mild kerion, when, as described further on, the hairs will become loosened, and the case easily and quickly cured.

If the places continue very tender, raw, and inflamed, and will not become at all like kerion, it is best to use some oil of cade to them: this generally diminishes the tenderness, and then, perhaps, Coster's paste may prove the best application.

Cases that rapidly get tender and sore, yet in which the skin will not become infiltrated sufficiently to loosen the stumps, are troublesome ones to treat, as the child complains so much of the pain; but they can generally be cured more quickly than those in which there are no inflammatory symptoms.

Caps. There is no necessity for wearing a cap

* The carbolic acid, citrine, and sulphur ointment.

during the day, unless all the hair has been removed; although it is advisable to use one at night. The chief use of caps is to prevent the pillow-cases getting saturated with the preparation, and thus causing irritation of the face by the child lying on the soiled places. I believe the best way to avoid this, is to put over the head a piece of lint, or a linen cap, which must be constantly washed with carbolic soap, and then over that a black silk one, lined with oil silk.

In using carbolic glycerine, or any other remedy, over the entire scalp, it is necessary to exercise some care to prevent the preparation from getting on to the forehead or face. Sometimes the edge of the cap will get saturated, and cause much irritation on the more delicate skin of the forehead.

If there are only a few patches, and the hair has not been entirely removed, it is most important to rub some carbolic glycerine, or the ointment described subsequently, *all over the head*, during the first week or two of the treatment. If this is not done, the disease may spread, or, which is more likely, minute places just commencing, that have been overlooked at the first examination, will develope themselves; but if the ointment is used this will be prevented, and the patches of incipient disease will soon be cured.

Carbolic glycerine is a favourite remedy of mine, yet, where there is a large extent of surface involved, I doubt if it is as good as the following ointment, which I have used during the last two years, very freely, and with excellent results, viz :—

℞ Carbolic acid (pure).
Citrine ointment (ung. hydrarg. nit.)
Sulphur ointment, in equal parts.

In writing a prescription for this ointment it is important to tell the chemist *not to apply any heat*, and to mix the citrine and sulphur ointments first, and then to rub in the carbolic acid. This should be made fresh every week, and can be applied without fear to the heads of children over eleven, every night, and to the patches again the next morning. But in children under this age it is advisable to use a double proportion, or even more of the sulphur ointment.

For a child under five years old I should *at first* use about *four* parts of sulphur ointment to *one* of each of the other ingredients; while for one between six and seven I should advise *three* parts of the sulphur ointment, or if eight or ten years old, only *two* parts.

If the ointment be applied all over the head, it must of course be weaker as regards the carbolic

acid and citrine ointment, than if only used to a few detached places. Equal parts of all three can generally be applied to individual patches.

This treatment, as a rule, causes no pain, and is very effectual. Of course, in accordance with the rule mentioned before, the head will not have been blistered, if the patches are extensive. A cap should be worn as before described, and the head well washed every other day, all scabs being removed from the patches, and epilation freely practised. The scabs will turn of a blackish colour, especially if the ointment be used after being made a week, as a sulphide of mercury forms. While using this ointment all over the scalp, I often apply strong carbolic glycerine (equal parts) to the patches.

I have sometimes noticed that this ointment, after being used for a while, causes the stumps to become loose in the follicles, so that they can easily be extracted with the roots; and I may mention that it generally turns the hair of a light golden colour.

Since the first publication of this method of treatment in *The Lancet*,* I have been informed that the ointment has been very effectual in nu-

* *Ringworm (of the head) its Diagnosis and Treatment.* The Lancet, Jan. 10th, 24th, and 31st, 1880.

merous cases; and as I have myself used it very freely, both in this school and in private practice, *I can strongly recommend it for all ordinary cases of ringworm.*

I have often seen slight forms of kerion produced by it, especially in young children, and have thus cured in a few weeks, cases that might, under ordinary treatment, have gone on for many months.

It is impossible to notice all the good remedies for simple ringworm, but I may mention that Goa powder, or chrysophanic-acid ointment is efficient, although inferior in my opinion to the above, while it certainly has so many drawbacks that I have discontinued its use. It stains everything with which it comes into contact, even the face and hair, besides often causing great irritation and swelling of the face, and even eczema impetiginodes. I once applied it to a girl of ten having very nice hair, which it turned such a frightful colour that the parents were only too glad to have it all shaved off.

Where there are only two or three small and *recent* patches, it is a good plan to apply freely a paste, made of two drachms of iodine and six drachms of oil of cade, covering the places with a piece of lint. This will produce a scab, which

may be removed in a few days, and then some more paste can be used.*

It is a great mistake to continue the application of any parasiticide to the *outer* surface of a scab, as it does not penetrate, and the fungus may be rapidly growing beneath it. It is therefore best to pick the scab off with forceps, as soon as formed, and to epilate freely before applying the remedy again. If there is any difficulty in removing the scab, it should be soaked in oil, and poulticed all night, when it will easily be removeable the following morning. Coster's paste can be repeatedly applied till all the diseased stumps are removed; carbolic oil (1 in 8) being also used to the whole head, to prevent the extension of the disease.

Mr. Morrant Baker uses *creasote* with iodine, instead of the oil of cade. Of course this preparation has a strong, and to most a very disagreeable smell, but it is very efficacious for ordinary small places of ringworm.

Blistering fluid and glacial acetic acid are also very good remedies for recent patches, especially if applied to any of the small ones detected while

* The original Coster's paste is made with colourless oil of tar. I prefer the oil of cade as it forms a stiffer paste, especially after being made and exposed for a time to the air. This thicker preparation is not so apt to run, as the ordinary Coster's paste.

others are being treated; and it is often advisable to apply one of them, occasionally to a patch under treatment with other parasiticides. It is sometimes necessary to change the remedy, even in ordinary cases, as a parasiticide that will succeed with one child may fail with another.

The two following were favourite remedies of the late Dr. Tilbury Fox:—

No. 1. ℞ Sulphate of copper, gr. x to xx.
Oil of cade, (ol. junip. pyrolig., ʒ iij.
Sulphur, ʒ iij.
Ammonio-chloride of mercury, gr. v to xx.
Benzoated lard, ℥ j.
Mix.

No. 2. ℞ Oil of cade, ʒ iij.
Sulphur, ʒ iij.
Tincture of iodine, ʒ iij.
Carbolic acid, gr. xx to xl.
Benzoated lard, ℥ j.
Mix.

The latter is useful in cases of very irritable scalp.

Perchoride of mercury, two to six grains to the ounce, is used by some; but I rarely advise it, as it is so poisonous.

During the treatment of ringworm of the head, the body should be examined now and then, especially the neck, for any small patches of tinea circinata, and it is important not to devote all the attention and treatment to one or two patches; for while these are being cured, if proper precautions be not taken, other small spots, where the disease has been overlooked in its incipient stage, make their appearance; and the medical attendant may find when he has cured the first patches, that he has several more to deal with; therefore, the whole scalp should be constantly examined during treatment.

CHAPTER V.

The Treatment of Chronic Ringworm.

First. where a large extent of surface is diseased.

There are some cases of chronic ringworm which no *ordinary* remedies, even under skilful hands, will ever reach. The treatment of these I now pass on to describe; as well as the treatment of those cases in which the disease has been attended to until the hair has grown again, and then been neglected for months, *or even years* (because they were supposed to be well), until some special reason has brought them under the notice of an expert.

Here the difficulty is not to find some parasiticide that will destroy the ringworm fungus, but to bring the remedy into contact with it. In *recent* ringworm the conidia only penetrate a certain distance into the follicles, and therefore the disease is easily cured by almost any remedy; *but after a time they penetrate to the very bottom of the follicles,* (which it must be remembered are

even below the true skin,) *and into the bulbs of the hairs.* It is therefore impossible to reach the fungus by any ordinary remedy applied to the surface of the scalp, as the stumps plug the follicles into which we require the parasiticide to enter. Moreover the stumps become so diseased, and therefore brittle, that they cannot be extracted by epilation, but break, and leave the root part swarming with the fungus down to the bulb, (*vide* diagram, p. 9). One must therefore select a remedy that will penetrate deeply into the follicles, and Mr. Marshall's preparation of oleate of mercury is certainly the best for this purpose, combined afterwards, if necessary, with the treatment I call *the artificial production of kerion.*

I have seen oleate of mercury cure the most inveterate, and extensive cases, which have existed for many years, and on which all sorts of other remedies have been tried in vain. It does not cause much pain—very often none; and although I have used it most extensively for years, I have only once seen slight salivation caused, and that was in a child of four years of age. It is prepared as a thick solution in oleic acid, and sold as a ten per cent. and five per cent. solution. I use the five per cent. for children under eight years of age, and the ten per cent. to those over that age, if the skin will bear it without much irritation.

It is advisable to have acetic ether mixed with it in the proportion of one part of ether to seven parts of oleate, to increase the penetrating power; and the mixture must be kept in a stoppered bottle.

The treatment is preceded by having the hair cut short, say about half an inch long. The head should then be thoroughly washed with soft soap and water, and, when dry, *the oleate should be rubbed well into the entire scalp,* with a small sponge mop. This must be done regularly night after night, especially into the patches, and again in the morning into any well-marked diseased places. Care must be taken not to apply too much oleate, so as to prevent it running from the head on to the face or neck. The caps before described (page 38) should be worn at night, special precaution being taken that the oleate does not run on to the face or pillow-case, as it will produce much irritation, and even a rash. It is necessary to apply a thin towel round the head, like a turban, as well as the cap, to prevent any oleate getting on to the face.

It is most important that the head should not be washed more than once a fortnight. If water be constantly used, it tends to prevent the oleate from soaking to the bottom of the hair-follicles, which it is so essential that it should do in order

to obtain a successful result. Therefore, while the case is under treatment, which may be from three to five months, wash well every fortnight, cutting the hair again, and removing all the scabs and yellow incrustations with the point of a pair of forceps, small-tooth comb, or other means, and then examine the scalp with a lens, to see how the case is progressing, before applying the oleate again. If there are any distinct patches, epilation should be very freely and often practiced with a broad pointed pair of forceps. Of course care must be taken that no mercurial symptoms arise during the treatment. If the ten per cent. solution produces too much irritation, the five per cent. must be substituted. It is important to obtain the oleate from a good chemist, and to have it freshly made.

After from three to five months, a complete cure is often effected; or at any rate the disease will be very much better, and restricted to the original patches or a few disseminated stumps. It is at this stage of the case, that I strongly recommend what I have called *the artificial production of kerion—i.e.,* that swollen, raised, inflamed, and infiltrated state of the scalp, which sometimes accidentally occurs during treatment, and *which then always results in a speedy cure of the disease.*

CHAPTER VI.

The Artificial Production of Kerion.

THE TREATMENT OF CHRONIC RINGWORM, WHERE THE DISEASE DOES *not* EXTEND OVER A LARGE EXTENT OF SURFACE.

Kerion is a variety of the disease that sometimes occurs accidentally during treatment, or that may arise spontaneously. The patches become tender, raised, swollen, red, and infiltrated. If this happen, it is, in my opinion, a most fortunate occurrence, as it is nature's method of effecting a cure. Observing this, I have constantly, for more than six years, been in the habit of using croton oil for the *artificial production* of this variety of the disease, and *can most positively assert, that in imitating this curative action of nature, we have a most valuable means at our disposal for eradicating inveterate patches of ringworm,* even when all other treatment has failed.

Kerion should be produced, if possible, in *small inveterate patches of chronic ringworm that have resisted all other treatment for months or even years, and not in those cases where the disease extends over a large extent of surface.* Croton oil is the best

irritant for causing this inflammatory condition; but it must be used with great caution, and at first only applied to a small place, and its effect watched. I generally put it on a patch about the size of a shilling, with a small camel's hair brush, and order a poultice to be applied at night. Then, if it has not set up severe inflammation and pustulation by the next day, which is very rare, I apply it again, keeping poultices constantly on day and night. A pustular rash occurs at once, but the oil can be applied *over* this; and a daily application of it for three, six, or ten days, together with constant bathing with warm water, and frequent poulticing with linseed-meal, will generally set up such inflammatory exudation, that the patch resembles true kerion. It becomes very tender, swollen, puffy, pustular, and even boggy to the touch, and is usually covered with a thick yellow incrustation. On removing this yellow substance with the point of the forceps, and a sponge and warm water, the skin underneath will be found very red and tender, with sometimes a muciform or purulent discharge exuding from the follicles, and, what is most important, *the hairs and stumps loose in the follicles.* They either come away with the discharge, or can be easily pulled out. If the patch be very much swollen, the hairs on being

extracted, come out from a considerable depth.

When the patch is so thoroughly inflamed and infiltrated that the stumps come out easily, I content myself with simple poulticing and bathing for a few days; and then, when the tenderness has abated, and the yellow incrustation has been removed by bathing, I begin to pull out all the hairs and stumps that are left on the patch, using for this purpose the broad-pointed pair of forceps.

If there is more than one patch, I soon begin to apply the oil to the second or third, when I see that the first one is progressing favourably, and thus try to get every place converted into kerion. The largest patch I have inflamed at one time has been about the size of a five-shilling piece; but I should never attempt such a large one at first, and would prefer to treat a half or a third of it, and then the rest afterwards.

While the croton oil treatment is being followed out, a little oleate or carbolic glycerine should still be applied to the other parts of the scalp. When once a stump has been extracted with the entire bulb, there is no fear of the new hair becoming infected with the fungus, as some of the parasiticide used is sure to get into the follicle, and destroy any conidia left there.

Great care must be taken not to produce any

slight sloughing of the upper stratum of the skin. *The great aim of this treatment is to cause inflammatory swelling and effusion into the tissues around the follicles,* so that the loosened stumps which otherwise would break off on attempted epilation, will now come out with the discharge, or can easily be extracted; in fact, very often in a short time an inveterate patch of ringworm, that has withstood every other treatment for years, can be transformed into a smooth, shining, slightly raised red surface, utterly destitute of all hair and stumps, and practically well.

Soothing remedies, such as poultices or water-dressing, should be applied till all the inflammatory swelling has subsided, while the remaining stumps are removed day by day by the attendant. I usually see a case in this state every three to seven days, and carefully examine the spot with a lens to discover any stumps which may need extraction. Spermaceti ointment may now be used; and when the swelling has subsided, and a bald place remains,—all traces of inflammation having passed away,—a cantharidine hair wash,* or tinc-

* ℞ Tincture of cantharides, ℥j or ℥iss
Acetic acid, ℥j.
Glycerine, ℥iv.
Spirits of rosemary, ℥j.
Rose water, to ℥viii.
To be well rubbed into the bald places, night and morning.

ture of iodine, should be employed to stimulate the new downy hair to grow.

The bare patches that remain after this treatment may continue for a month or two; but the hair will grow again sooner or later, if kerion *only* has been produced.

Especial care should be taken not to apply too much croton oil at a time, and to see that the poultice is firmly fastened to the spot; otherwise the oil may run on to other parts of the head or forehead, and, by the poultice slipping, kerion may be produced where it is not wanted. If the oil by any means gets on to the pillow-case, and the child rubs its face on it, of course a pustular eruption will follow. I once saw a little girl who had managed to get the oil on the pillow-case, and then during the night, had rubbed her forehead and cheeks upon the soiled linen. This produced a most universal crop of small pustules on the face, and gave me very great anxiety lest some marking should ensue; but with soothing applications and simple ointment, the slight crusts were speedily removed, and not the least mark remained. Of course, *with proper precaution this should never occur.*

Even when one or more patches have been treated in this way, in the course of time other small places or isolated stumps reappear here and

there; therefore the whole scalp should be examined week after week, and any stumps removed or touched with croton oil, as described further on under "disseminated ringworm." But even when the case has been pronounced absolutely well, these isolated stumps will often crop up, time after time, for months, and hence children ought to be examined regularly for a few months after the disease appears to be eradicated.

Some remedies may produce kerion unexpectedly. I have seen carbolic glycerine, citrine ointment, and oleate of mercury act in this manner; and lately, since using the ointment of sulphur, citrine, and carbolic acid, I have constantly seen slight kerion produced by it, especially in young children.

If this puffy state occurs *accidentally* during treatment, simple poulticing and bathing, as before described, must at once be adopted; and the hairs should be carefully extracted when loose.

The friends are, as a rule, greatly frightened when kerion is produced; so that it is better to explain to them beforehand the reasons for adopting this treatment, and the result to be expected from it. The condition is somewhat painful, and much *resembles* that caused by the formation of an abscess; the glands also often enlarge about the

back of the neck, but I have never seen them suppurate.

Sometimes kerion is rapidly produced, at others it is most difficult to obtain. Croton oil may be applied over and over again without causing the swollen, puffy state of the scalp desired; but, even if the infiltrated condition of the skin cannot be produced, and a deep pustular rash alone is formed, more or less inflammation is always set up, and the treatment very rarely fails in loosening the stumps and curing the disease.

If the pustular rash *only* has been produced, and *not real* kerion, it often happens that some of the stumps break on attempted epilation. If this occur, it is better immediately to place a minute drop of croton oil on or in the follicle, with the aid of a very fine brush or point of a gold pin, which will probably cause the expulsion of the stump in a few days. At the next examination I follow the same plan, and so on, until I cannot find a single stump, even after watching for a fortnight, or month.

In some very rare cases, where the scalp will not puff up and become infiltrated, but only inflame, and when croton oil has been employed many times, (and, perhaps, even a small quantity

of tartar emetic ointment),* I have seen a slight slough occur, and the hair has not thoroughly grown again. This *very rarely* happens, and as I only advise this severe treatment in exceptional cases, and on very small places, I consider that it is better for a child to suffer the loss of a slight quantity of hair on a small place, than by being prevented attending school to lose its education. Even if a few of the hair-follicles are destroyed by this treatment, many hairs will still grow on the place, and *a distinct bald patch is never left.*

Croton oil must of course be applied by the medical attendant; and I may mention, lastly, that I have never seen any internal irritation or erysipelas occur from its use.

As some discussion has occurred in the Journals since the publication of the greater part of the above remarks on kerion, I must call special attention to the fact that, *it is not a subcutaneous or other abscess.* I do not advise such severe treatment as that.

"Kerion," according to Dr. Tilbury Fox,† "has

* I rarely use tartar emetic ointment, as it is more apt to produce a slough of the upper stratum of the skin, than the oil. It should be used with *extreme caution* on a place already sore, and never on any except very small patches, that have resisted the action of croton oil.

† *Ringworm and its Management*, Dr. Tilbury Fox.

much the *appearance of* a threatening abscess, with loss of hair. The disease is made up of a patch or patches, which are circular, swollen, and so much raised and changed as to resemble a threatening boggy abscess. Each patch is more or less red, tender, feels semi-fluctuant and soft, and in the earlier stage is studded over with little openings, which are the mouths of the hair-follicles, and from each of which a muciform discharge, like the juice of the mistletoe-berry exudes. Some of the hairs are lost, but many others emerge from these orifices, and can be readily pulled away, and, in fact, they are lying loose in the follicle; others lie loose about the patch. After the early stage, the hair falls of its own accord, and a swollen, red, inflamed, exuding patch is left. If the hairs are examined they will be found to be surrounded and loaded with fungus. The disease is modified by the inflammation of each follicle, and the inflammation detaches the hair from its root-sheath, so that it lies loose in the follicle."

This is true kerion—a variety of the disease that may occur idiopathically, or under any treatment—the artificial production of which I specially advise in suitable cases.

A deep pustular rash is easily formed by croton

oil, but that *alone* is not the *essential* part of my treatment, which consists in *the actual infiltration of the true skin with inflammatory products, causing the hair to become loosened.* If this state can be produced the case is practically cured, and the further use of parasiticides is not necessary, as the inflammatory effusion destroys the fungus.

I should be sorry for the Profession to think I advocate the production of kerion *indiscriminately* in chronic ringworm, especially where a large extent of surface is involved. In fact, the chief cases for which I urge it are those I so constantly see, where, after ordinary treatment for a time, the hair has grown again on the patches, and the child has then been neglected for months or even years, until some special reason brings it under treatment again.

Ordinary chronic forms of the disease can generally be cured without producing kerion. Painting the places with croton-oil liniment is a good plan; and other remedies, especially the ointment already described, will often cause a moderate amount of inflammation, and even slight suppuration, and thus cure the disease.

A deep pustular rash alone, involving the tissues to the depth of the hair-follicles, will often cure chronic ringworm, but *certainly not all inveterate*

cases. I know full well, from painful experience, that croton oil may be painted on time after time, and a pustular rash repeatedly set up, and yet diseased stumps will reappear.

If such a case be left alone after one or two applications of the oil, followed by a pustular rash and yellow incrustation, *but without the puffy swelling of the part,* all may seem well, and the disease may *appear* to be cured, yet the stumps will probably crop up again and again. I speak very strongly on this point, as medical men so often make a mistake in thinking a patch well because it appears free from stumps. In ordinary private and hospital practice, patients are often not seen again when they have once been considered well; and yet if they were examined after two or four weeks, (as boys are, after having had ringworm, in a large school,) the diseased stumps would constantly be found to have reappeared.

I at first employed the liniment of croton oil, but gave it up four years ago for the pure oil, as the alcoholic solution is more apt to run beyond the limits of the spot painted with it, and thus cause pustulation where it is not wanted. This is especially seen when applying the oil to isolated stumps.

THE FOLLOWING, IN MY EXPERIENCE, ARE THE MOST SUITABLE CASES IN WHICH THE PRODUCTION OF KERION MAY BE ATTEMPTED.

1. Inveterate cases that have resisted all other treatment for months or years, if not very extensive; especially those where the inveterate parts of the patches have been marked out and reduced in size by other treatment, as by oleate of mercury.

2. Any small patch of ringworm, not larger, say, than half-a-crown, where time is of the utmost importance, and a cure is desired as quickly as possible.

3. In cases for example, where ringworm has been detected and properly treated for a time, until the new hair has made its appearance; after which, treatment has been discontinued, although many diseased stumps remained. Months, or even years, have passed, and the child is perhaps rejected at some public examination. One or more patches are to be seen where the hair is growing freely and firmly, but, on close inspection with a lens, some scurfiness and broken hairs or stumps are observed, scattered among the long hairs on the patches.

4. Pustulation, in minute spots, should also be attempted, as probably the only cure for that

variety of the disease I call *disseminated ringworm.*

In conclusion, I would warn medical men *not* to apply croton oil to *ordinary* cases of chronic ringworm, without due consideration. If they do, they will be sure to get into trouble sooner or later. The oil often causes much inflammation, and parents get frightened, and imagine the doctor has made the disease ten times worse. Sometimes they will seek other advice, and are told that their former medical attendant has been greatly over-treating the case, and has been using too strong remedies. Under soothing applications, the little patient gets well, and the second attendant gets the credit of curing the ringworm, which was practically well when he first saw the case. I always explain to parents beforehand the reasons for adopting this treatment, and the results to be expected from it. It is also important to bear in mind that simple remedies will generally be efficacious in eradicating ringworm in young children, and that in such cases stronger ones should never be employed.

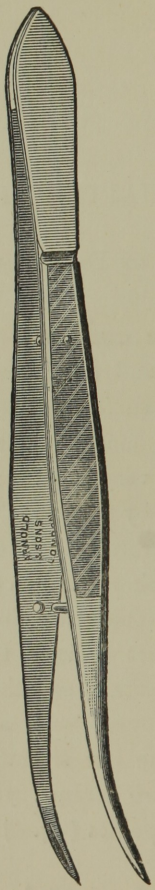
CHAPTER VII.

The Treatment of Disseminated Ringworm.

In some inveterate cases, where all the patches have disappeared, and the disease has passed into the *disseminated variety*, (described page 8), I believe the best chance of a cure is to subject the entire scalp to a very close examination with a lens, and to place by the aid of a very fine sable brush, a drop of croton oil, wherever the isolated stumps or the black spots can be seen. (I consider a case where the black dots are observed,* as one of the most difficult to cure). The oil usually causes a pustule, and the loosened stump can then be removed with a pair of forceps. Those made for me are slightly curved towards the ends, which are strong, yet fine, and have minutely serrated points (fig. 4).

* *Vide* page 7.

FIG. 4.*



* These forceps, as well as the broad-pointed ones, are made for me by Messrs. Arnold and Sons, Smithfield, E.C.

The glass I use is a combination one, as advised by Dr. Fox; but it is mounted on a firm stand with a ball-and-socket joint, so that it can be placed in any position, while both hands remain free for manipulation. But the small unmounted one, (fig. 5), or an ordinary lens, does very well, and answers all practical purposes.

FIG. 5.*

I manage to thoroughly examine the entire scalp by commencing at the top, and turning over layer after layer of the hair in the wrong direction, with one blade of the forceps, while I hold down the hair just turned over with my left hand, until the whole back of the head has been inspected. During this time I examine the scalp minutely with my glass or simple eyesight alone;

* This lens can be obtained at Messrs. Carpenter and Westley, 24 Regent Street, W.

and then, turning the child round, look over the front part of the head in the same manner.

In treating a case like this, it is advisable not to have the hair cut too short, but to keep it about two or three inches long, the stumps being then more easily observed, as the long hair is held back with the finger. The child should be seen once a week, and an attempt made to pull out every stump as it comes into view: if it break off, which is most probable, a drop of croton oil should at once be applied to the follicle. At the next examination, the oil must again be put on the remains of any stumps that break off, as well as upon any fresh ones that may appear. In a very bad case this may have to be done for weeks or months before a complete cure can be effected.

I often use the point of a fine gold needle, instead of a brush, and run the point, covered with oil, into the follicle itself. This rarely fails to destroy the diseased stump.

During this time, if there are very many stumps to be seen, I prefer, but it is not essential, to have the hair kept only about two inches long, and a large, thin poultice worn, day and night, under an oilskin cap. The constant heat and moisture very much help the croton oil to produce the necessary pustulation, and, by preventing the

spots from drying, render the extraction of the stumps easier. In fact, with a case like this, I like to have the scalp well bathed with hot water for ten minutes before I commence extracting the stumps; and also to have a small basin, with a sponge and some water in it by my side, on which to wipe off the extracted stumps from the forceps.

This treatment must be continued until a fortnight or month passes by without any stumps being seen, and then the case may be considered well.

I have often succeeded in curing cases like this, when they have resisted all other treatment for years, but they require great care; and I must remark that it is useless for medical men to attempt to cure this variety, unless they thoroughly realise how intractable the disease is, possess a good lens, and good eyesight, and have plenty of time and patience.

For the last few years I have used a remedy suggested to me by the late Dr. Fox, where there are only a very few minute patches, and *where time is of the utmost importance.* This is a paste made of equal parts of crystalised terchloride of antimony and lard. It is most intensely escharotic, and *always produces a bald place,* by destroying the hair follicles wherever it is applied.

Therefore, *it must only be used in very exceptional cases,* and to places not larger than half a split pea. I have sometimes used it to a very chronic patch, when it was absolutely necessary to get it cured by a certain time, and often apply a very minute dot of it, with the point of a gold needle, to the black spots so often mentioned before, as well as to any isolated stumps that cannot be removed under the croton oil treatment; but I must again warn anyone against applying it too freely, as it is sure to cause a slough, and, therefore, a bald place.

Every species of treatment will fail sometimes; and I believe there are undoubtedly inveterate cases that cannot be cured, although such almost always get well spontaneously at about the age of fifteen to seventeen. I have hardly ever seen a boy leave this school at the age of sixteen with any stumps still remaining. When I have had such inveterate cases in the school, I have continued to use the carbolic oil, or some other mild parasiticide at night; and thus, while they have been allowed to attend school, I have prevented the disease spreading to other children.

CHAPTER VIII.

General and Constitutional Treatment.

With regard to general treatment, disinfection of the clothes is advisable; and therefore coats, neck-ties, &c., ought to be well baked, and the linen, flannels, &c. boiled. Caps should have the lining removed and destroyed, and they should also be well baked, or even burnt if old and worthless. Brushes, combs, and towels used by the patient, must be kept apart, the former being cleansed with carbolic lotion (1 in 10), the latter well boiled.

The best *preventive* I am acquainted with is carbolic oil, in the proportion of one to eight of olive oil. This should be applied to the heads of the other children, when one in a family has ringworm; and it can be used for months without producing any ill-effect.

When one in a family of children is affected with ringworm, the most stringent precautions, as regards isolation, disinfection, &c., must at once be taken (as directed under "Ringworm in

Schools"), or it will probably spread to the others.

The doctor should at first personally superintend the application of the remedies, and should show the mother or nurse how to epilate, and to rub in the required ointment, &c.

Great care should also be taken, when carbolic glycerine is used, to inform the nurse of the *poisonous nature* of the remedy, so that it may be *safely* put away when not actually in use.

Constitutional Treatment.

Internal treatment is not of much use in ordinary ringworm, nor in recent cases; but in the inveterate forms, especially in weakly, anæmic, ill-nourished children, of a strumous or lymphatic diathesis, it is advisable to give cod-liver oil and steel, together with a generous diet, and other tonics if necessary: and sometimes also arsenic is useful. Dyspeptic symptoms, if present, must be removed with alkalies and tonics.

It is a remarkable but certain fact that children with chronic ringworm generally dislike fat. Nevertheless it should be given in some form or other, as cod-liver oil or cream. Change of air also, is sometimes beneficial in chronic cases; but *the local treatment is the most important.*

Scurf after Ringworm.

As a rule all scurf disappears from ringworm patches, as soon as the disease is *perfectly well;* but sometimes a place may remain scurfy for a long time after the fungus has been destroyed. In a case like this, glycerine, with an eighth part of carbolic acid, should be tried; or citrine ointment, diluted with three to seven parts of lard.

Chronic scurf, however, is *much more likely to be due to the disease being still uncured, and therefore in a contagious state.* In fact *most cases of apparent simple scurfiness,* left after treatment, *are most inveterate forms of chronic ringworm,* which probably can only be cured by the production of kerion. I therefore strongly advise everyone to be very careful, and not immediately conclude a case is *simple scurf,* but to most *minutely examine the scalp with a lens,* to see if there are not a few isolated stumps scattered about, or even the black dots before described (page 7).

It is also important to remember, that *no reliance whatever* can be placed upon the microscopical examination of long or *cut* hairs taken from a suspicious spot, but only of the short stumps (if

present); and that the only certain proof of a place being *absolutely well,* is the entire absence of diseased stumps or black dots, and the free growth of new downy hair from all the follicles. Sometimes a few follicles may have been destroyed by severe treatment, when of course a bald shining place will remain, but *no minute black dots should be visible.*

CHAPTER IX.

Ringworm in Schools.

INCLUDING THE QUESTIONS OF "CERTIFICATES" AND "ISOLATION."

I AM of opinion that the principal of every properly managed school, on the first admission of a pupil, should insist that the certificate of health, signed by the medical man, should state "*that he has made a thorough examination of the child's head and body, and that no trace of ringworm exists.*" An ordinary certificate, stating "that the applicant is in good bodily health, and free from infectious and contagious disease," is not sufficient, as it may have been granted *without any special examination of the head*, and often without undressing the child. Of course in large schools, where there is a medical officer, this certificate can be dispensed with, as he will most certainly examine every boy and girl before admission, and reject any who are still suffering from ringworm.

Children having any form of the disease should

not be admitted into a school until they are quite cured, except, perhaps, when a child has been thoroughly well treated for a year or more, and yet a few isolated stumps remain that cannot be immediately removed, at any rate under the usual treatment, even of the most skilful kind. These special chronic cases are brought up, as I too well know, for admission into public schools, at short intervals, during one or even two years, although constantly under the best medical treatment. What is to be done with such cases? With regard to Christ's Hospital, when boys reach a certain age they cannot be admitted, and therefore the time arrives sooner or later when a boy must either lose his presentation or be passed into the junior school suffering from chronic ringworm. When this time arrives I advise admission into this particular school rather than that a presentation should be lost, as I am strongly of opinion that these cases can be admitted with comparative safety to the other boys, provided they are regularly looked after, and some parasiticide, such as carbolic oil, used to the head, while the stumps are removed by the croton oil treatment. I have had boys in the London school under these circumstances, and have found that they have not spread the disease. Again,

it must be remembered that if chronic cases be admitted into a school, even when they are apparently free from all stumps, they almost always relapse, and thus a boy who has suffered from chronic ringworm is almost sure to have isolated stumps appearing for months.

For these reasons I always allow a boy already in the school, who is suffering from disseminated ringworm, of an old inveterate character, *and under proper supervision and treatment,* to mix with the other boys, and firmly believe it is a safe course to follow. I feel confident that the rest of the boys in a school run less risk of taking the disease from these disseminated cases, *under proper supervision,* than they do from mixing with other children in private families; *for such children are frequently found to have ringworm without its being known, and are therefore not under any treatment,* as is proved by the fact that children supposed to be free from the disease, and who are brought for admission into this school, from all ranks, are found to have ringworm in the proportion of over eight per cent.

Nevertheless I consider it extremely wrong to send children, *not absolutely well,* into any school, unless they are under *very special treatment,* and the facts of the case are known to, and approved

of either by the medical officer, or principal: but children are often sent back to school, *even with a medical certificate,* stating, that the ringworm is *now cured,* and that the child is not likely to convey the disease to other children, *when it is in a most chronic, and certainly a contagious state.* Thus the disease may be unsuspectedly introduced, and spread widely before the evil is discovered.

The school matron, or other person in charge of a number of boys or girls, ought to examine the head, and upper part of the body of every child, directly they return to school after the holidays; as during their absence they may have caught the disease by mixing with other children who have unsuspected ringworm, and therefore are not under any treatment.

This examination should be repeated every week during term time, and any child with a suspicious spot sent at once to the doctor for his opinion.

Children at school ought always to have separate washing flannels, towels, brushes, combs, &c., and the heads should be washed regularly, as well as the body, on "bath nights."

It is also advisable to have all hair-cutting operations performed *inside* the school, whereby all risk of infection from without will be avoided; and the hair-cutter should use a separate brush and comb for each distinct set of boys.

When ringworm actually breaks out in a school, or family of children, besides the general treatment already mentioned, especially the keeping separate the combs, brushes, towels, &c., a careful examination of every child ought to be made, by some one who thoroughly understands the appearance of ringworm in its earliest stage; and all cases detected ought to be put apart at once. I believe the complete isolation of recent cases to be most desirable, if possible. Then the clothes, especially the cap, of each infected child, ought to be disinfected; and the brush and comb removed from the general sleeping apartment, and, after being cleaned with carbolic lotion, set apart for the child's use during treatment.

The hair-cutter should cut the hair of the infected children *last*, and use the special comb and brush belonging to each child.

If the disease spreads, in spite of isolation, the best plan is to rub a little carbolic oil (1 part in 8 of oil) on the heads of all the non-infected children, and to insist on a frequent and thorough washing of all the heads with carbolic soap. This will generally stop the spread of the disease; but it is of the utmost importance that the nurse who does this is *not* the one who is attending to the infected cases.

An intelligent nurse ought to be employed to oil the heads; and she should be taught to recognise small places of ringworm in its early stage, or else she may help to spread the disease, by first rubbing a boy's head who has recent ringworm, and then a non-infected head.

A separate nurse ought to have charge of the ringworm cases, and if they are very numerous, it is better to divide them into the recent and slight cases, those that are more severe, and those that are nearly well. The linen should be boiled, and washed apart from the general linen of the school.

The dietary should also be seen to, as the underfed, and ill-nourished, are the most prone to take the complaint. If the children are pallid, an extra allowance of meat should be given, with iron, and perhaps, cod-liver oil. The proper amount of cubic space, and ventilation of apartments must also be attended to, if the disease is increasing, as it may be due to the fungus being blown about with the dust in the wards. Dr. T. Fox has conclusively shown that this may be the cause of the disease spreading in schools.

The most difficult point of all is to decide when a child may again mix with healthy children. It is the safest plan to keep the patient separate till

absolutely well, which can only be determined by the complete absence of stumps, and the growth of new downy hair on the patches, as before described.

In conclusion, let me again call attention to the principal *practical* points I have touched on in the consideration of this important subject. In the first place I would remark, that as so many medical men consider ringworm well when it is in a most chronic state, it is important not to certify a case as cured, although the hair may have grown again on the diseased patches, until we are satisfied from a thorough examination of the scalp that there is not a single stump remaining affected with fungus, or even a single black dot, or follicle with no hair growing from it; and that no child should be certified as free from the disease, and fit to enter a school, unless the whole head has been minutely examined, and the body also.

Medical men should also bear in mind that there is such a variety as *disseminated ringworm*, where no patches exist, but only isolated stumps, and that this is one requiring very great care for its detection; that stumps are not effectually removed if they only break off, as is commonly the case; that no reliance for diagnosis or prognosis

can be placed on the microscopical examination of ordinary hairs, long or short, taken from, or around a diseased patch, but only of the short stumps; that ringworm of the head exists among young boys, without their friends being aware of it, in the proportion of over eight per cent.; and *lastly* that the disease is rarely contracted after fourteen years of age, and usually gets well spontaneously about the age of fifteen to seventeen.

As to *treatment*, I would specially call attention to the use of carbolic glycerine, or the ointment composed of carbolic acid, citrine, and sulphur ointments, for recent cases, and to the important practical points, that all remedies employed must be well and frequently rubbed in.

With regard to *chronic ringworm*, it must be remembered that the conidia penetrate into the bulbs of the hairs, and exist at the bottom of the follicles; that the difficulty in curing the disease is not to find a parasiticide, but to obtain one that will penetrate deeply; that the stumps are so diseased, and brittle, that they always break off on attempted epilation; that oleate of mercury is one of the best penetrating remedies; that it must be well rubbed in, and the head washed only once a fortnight; and that after a few months, if the disease is not absolutely well, kerion ought to be produced, on the patches.

With reference to *kerion*, it should be remembered that the artificial production of it as a rule, should only be attempted in small old chronic patches that have resisted all other treatment for months or years; that it should be produced by the daily application of croton oil, together with constant poulticing; that croton oil must be used with very great caution till the hairs get loose in the follicles, the great aim of the treatment being to cause inflammatory swelling of, and effusion into the tissues around them; that the stumps must be removed time after time as they appear; and that great care must be taken to prevent the oil getting on to the face.

Remembering *lastly*, that the *disseminated variety* is best treated by touching each stump with croton oil, week after week, except perhaps in those very *exceptional* cases, where a minute quantity of the antimonial paste may be required.